

Jpn. J. Ent., **62** (1): 151–160. March 25, 1994

The *Stegana* (*Steganina*) *coleoptrata* Species-group (Diptera,
Drosophilidae), with Descriptions of Two New Species
and New Records from Eastern Palearctic Region

Yao-guang HU

Department of Biology, Shenyang Teachers' College, Shenyang, China

and

Masanori J. TODA

Institute of Low Temperature Science, Hokkaido University,
Sapporo 060, Japan

Abstract Two new species of *Stegana* (*Steganina*) *coleoptrata* species-group, viz. *St. xuei* sp. nov. and *St. sidorenkoi* sp. nov., are reported from northern China and the Russian Far East. Two known species of the same species-group, viz. *St. baechlii* LAŠTOVKA et MÁCA, 1982 and *St. nigrithorax* STROBL, 1898, are newly recorded from the Russian Far East and Japan and from the Russian Far East, Central China and Taiwan, respectively, and are supplementarily described.

Key words: *Stegana coleoptrata* species-group; eastern Palearctic; new records; new species.

LAŠTOVKA and MÁCA (1982) thoroughly revised European and North American species of the genus *Stegana* MEIGEN, and established the *St. (Steganina) coleoptrata* species-group, including ten species. They suggested that "This group is perhaps of East Asian origin", although only three species had been known from there at that time. This paper reports two new species and some new records of two known species of this species-group from eastern Palearctic Region or northernmost Oriental Region.

We adopt the terminology and indices revised by ZHANG and TODA (1992).

Abbreviations of type depositories

- DBSC: Department of Biology, Shenyang Teachers' College, Shenyang,
China
EHU: Entomological Institute, Hokkaido University, Sapporo, Japan
IBP: Institute of Biology and Pedology, Russian Academy of Sciences,
Vladivostok, Russia

Stegana (Steganina) coleoptrata species-group

Stegana (Steganina) coleoptrata species-group: LAŠTOVKA & MÁČA, 1982: 8.

Diagnosis (slightly modified from LAŠTOVKA & MÁČA, 1982). Face with at least 1 horizontal dark band; clypeus and palpus yellow; katapisternum unicolorous; abdominal spiracles reduced in size and/or in number (at least, those of 2nd segment reduced in size); epandrium usually with more or less distinct anterodorsal apodeme; surstylus usually deeply concave on dorsocaudal margin, articulated with epandrium, with 1 stout prensiseta apically or subapically; gonopod well developed, forming somewhat curved broad plate surrounding dorsal part of aedeagus; aedeagus mostly widened distally, fringed with tentacle-like processes on apical margin; ejaculatory apodeme with slender stem and 1 pair of small, somewhat transparent patches at base of distal plate; oviscapt straight or slightly convex on posterior margin.

Other characters commonly seen in the following species are first described below.

Head: Eye brownish red. Frontal vitta submedially with a few interfrontal setulae. Gena and postgena yellowish white, with dark brown patch at postero-dorsal corner. Pedicel yellowish brown, with 1 stout seta and several setulae; arista with small terminal bifurcation.

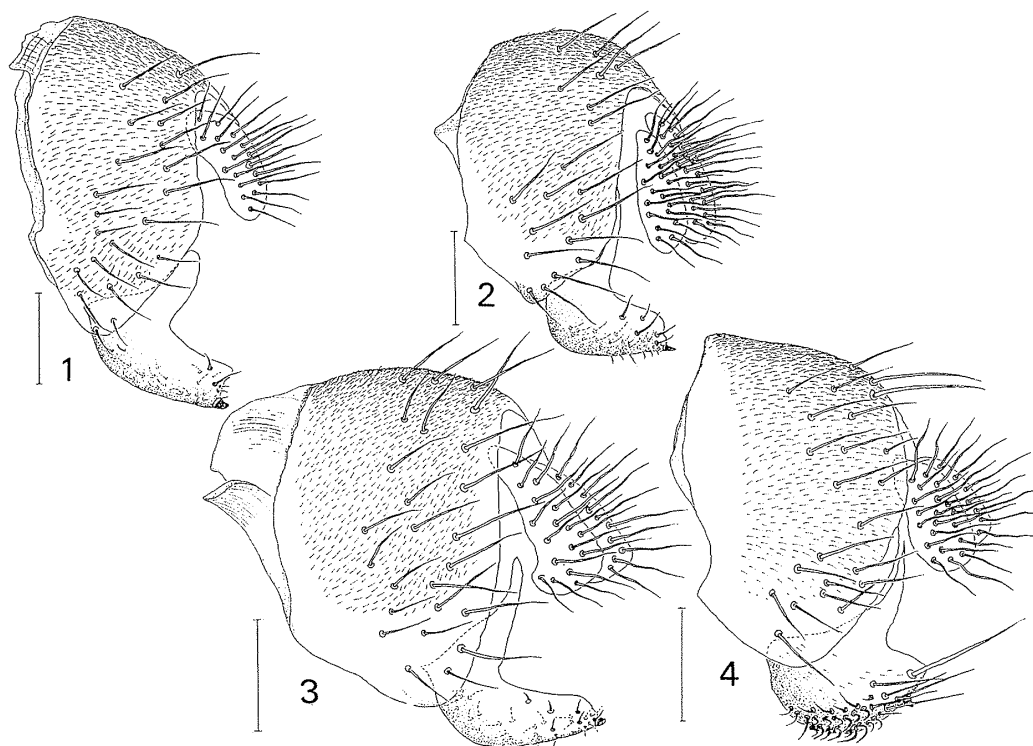
Thorax: Postpronotal lobe dark brown in upper 2/5, white in lower 3/5, with 1 long, stout seta and *ca.* 1 or 2 moderate ones slightly longer than other setulae. Distinct, broad, black, longitudinal stripe running from propleuron to base of halter; lower part of mesopleuron yellowish white. Apical scutellar setae crossed each other.

Wing dark fuscous, becoming paler posteriorly, and with its distal part curved downward. Veins dark brown; r-m crossvein clear. R_{2+3} markedly curved to costa at tip; R_{4+5} and M_1 distally strongly convergent. C_1 setae less differentiated. Third costal section with *ca.* 4–9 small warts on underside.

Legs: Apical seta on mid tibia; preapical dorsals on all tibiae. Mid tibia proximally with several stout setae on outside. Mid and hind tarsi with 2 and 1 row of minute cuneiform setulae on underside, respectively. Fore and mid 1st tarsomeres slightly longer than 2 and 3 succeeding tarsomeres together, respectively; hind 1st tarsomere as long as 3 succeeding together.

Abdominal tergites nearly entirely dark brown.

♂ terminalia: Epandrium broad, pubescent. Cercus separate from epandrium, not pubescent. Hypandrium arcuate, medially with 1 pair of large flaps fused to each other. Aedeagal guide laterally broad and membranous, medially forming somewhat sclerotized, long, narrow strip which is connected with base of aedeagus and base of median notch of hypandrial flaps. Lateral ends of gonopod contiguous to lateral arms of hypandrium.



Figs. 1-4. Epandrium, surstylus and cercus. — 1, *Stegana (Steganina) baechlii* LAŠTOVKA et MÁČA, 1982; 2, *St. (Steganina) nigrithorax* STROBL, 1898; 3, *St. (Steganina) xuei* sp. nov.; 4, *St. (Steganina) sidorenkoi* sp. nov. (Scale-line=0.1 mm)

***Stegana (Steganina) baechlii* LAŠTOVKA et MÁČA**

(Figs. 1, 5, 11, 15, 16)

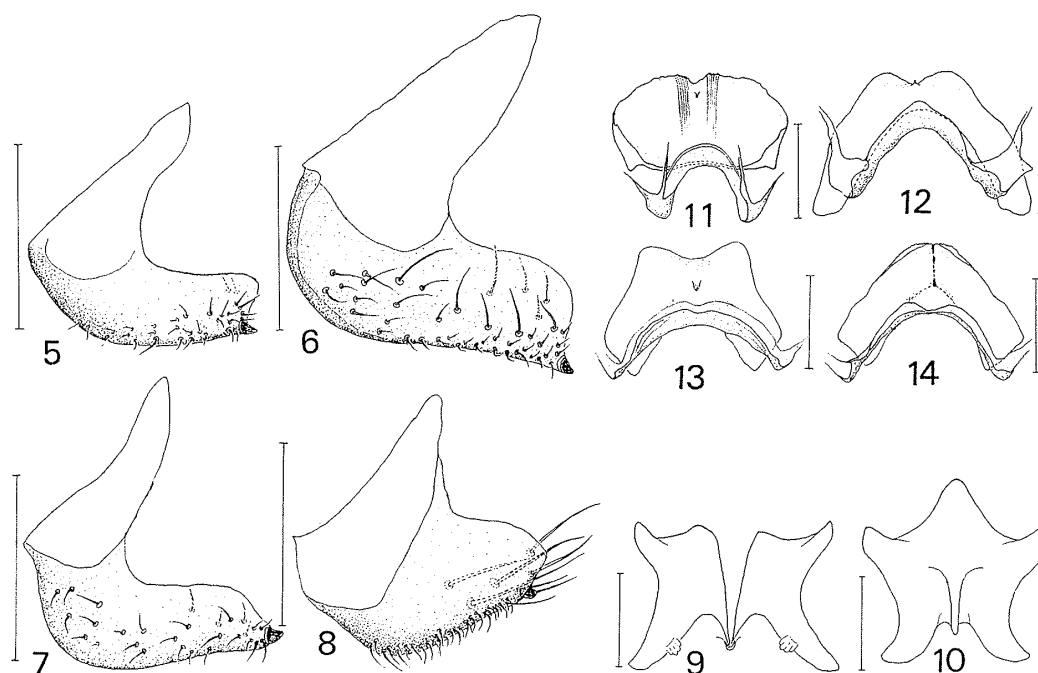
Stegana (Steganina) baechlii LAŠTOVKA et MÁČA, 1982, 12.

♂. Occiput grayish brown. Basal scutellar setae nearly parallel. Dm-cu crossvein clear. Abdominal sternites slightly broader than long.

♂ terminalia: Epandrium (Fig. 1) with *ca.* 40 setae. Cercus (Fig. 1) small, oval, with *ca.* 30 setae. Median flaps of hypandrium somewhat triangular; hypandrial apodeme well developed (Fig. 15). Gonopod (Fig. 11) with median furrow ventrally and small acute projection dorso-subapically. Paramere small, somewhat elongate, oval plate, with *ca.* 3 setulae. Aedeagal apodeme *ca.* 2.0 times longer than aedeagus.

Measurements: BL (body length)=2.31 mm, ThL (thorax length)=1.12 mm (range: 1.02–1.31), WL (wing length)=1.70 mm (1.67–1.73), WW (wing width)=0.80 mm (0.77–0.83).

Indices: arb (dorsal branches of arista/ventral branches of arista)=4 (5–6)/4 (4–5), FW/HW (frontal width/head width)=0.41 (0.40–0.44), ch/o (maximum width of gena/maximum diameter of eye)=0.16 (0.14–0.19), prorb (proclinate orbital/

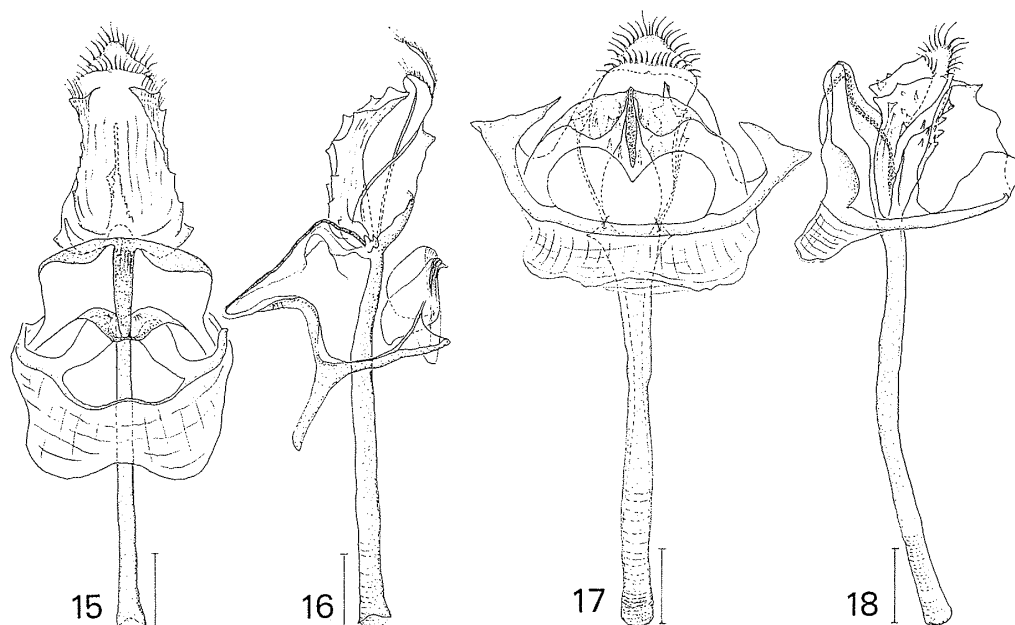


Figs. 5-8. Surstylus (inner view). 9-10. 10th sternite. 11-14. Gonopod (caudal view). — 5, 11, *St. baechlii*; 6, 12, *St. nigrithorax*; 7, 9, 13, *St. xuei*; 8, 10, 14, *St. sidorenkoi*. (Scale-line=0.1 mm)

posterior reclinate orbital)=1.24 (1.18–1.28), rcorb (anterior reclinate orbital/posterior reclinate orbital)=0.88 (0.79–0.98), vb (subvibrissal/vibrissa)=0.49 (0.35–0.59), dcl (anterior dorsocentral/posterior dorsocentral)=0.44 (0.38–0.51), presctl (pre-scutellar/posterior dorsocentral)=0.50 (0.49–0.50), sctl (basal scutellar/apical scutellar)=1.47, orbito (distance between proclinate and posterior reclinate orbitals/distance between inner vertical and posterior reclinate orbital)=2.06 (1.85–2.24), dcp (length distance between ipsilateral dorsocentrals/cross distance between anterior dorsocentrals)=0.22 (0.20–0.25), sctlp (distance between ipsilateral scutellars/cross distance between apical scutellars)=2.13 (2.00–2.32), C=2.08 (1.92–2.32), 4c=1.09 (1.04–1.15), 4v=1.84 (1.76–1.93), 5=1.25 (1.24–1.25), ac=12.76 (9.62–14.44), M=0.42 (0.41–0.43), C3F=0.62 (0.58–0.65).

Specimens examined. Russia: 1 ♂, Far East, 12. VIII. 1986, coll. V. SIDORENKO. Japan: 1 ♂, Lake Toya, Hokkaido, 5. VIII. 1984; 1 ♂, ditto, 6. VIII. 1985; 1 ♂, Morioka, Iwate Pref., X. 1980, coll. M. J. TODA.

Distribution. Europe, Russia (Far East; n. loc. rec.), Japan (Hokkaido, Tohoku; n. loc. rec.).



Figs. 15–18. Phallic organs. 15, 17, ventral view; 16, 18, lateral view). — 15, 16, *St. baechlii*; 17, 18, *St. nigrithorax*. (Scale-line=0.1 mm)

***Stegana (Steganina) nigrithorax* STROBL**

(Figs. 2, 6, 12, 17, 18)

Stegana coleoptrata var. *nigrithorax* STROBL, 1898, Mitth. Naturw. Ver. Steirermark (1897), **34**: 266.

Stegana (Steganina) nigrithorax: LAŠTOVKA & MĀCA, 1982, 27.

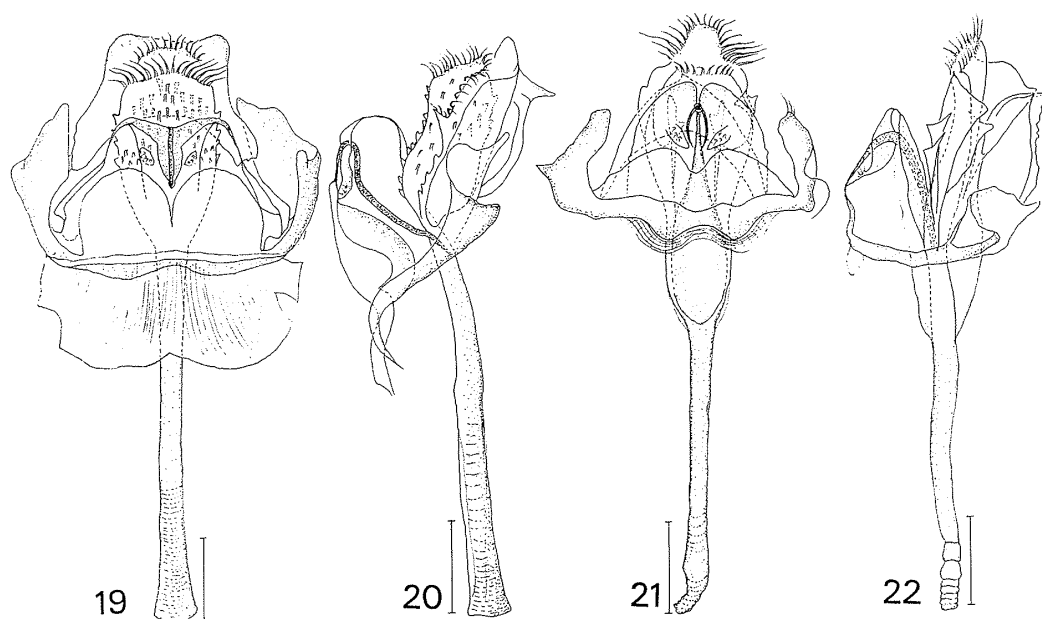
Stegana (Steganina) excavata OKADA, 1971, 86.

♂, ♀. Occiput dark brown. Basal scutellar setae divergent. Dm–cu cross-vein slightly clouded. Abdominal sternites much broader than long.

♂ terminalia: Epandrium (Fig. 2) with *ca.* 40 setae. Cercus (Fig. 2) narrow, ventrally somewhat broader, with *ca.* 40 setae. Hypandrium (Fig. 17) sometimes with minute paramedian spines; median flaps semicircular; hypandrial apodeme shaping moderately broad collar. Gonopod (Fig. 12) saddle-shaped, dorso-apically with small acute projection. Paramere absent. Aedeagal apodeme *ca.* 2.0 times longer than aedeagus.

Measurements: BL=2.90 mm in ♀; ThL=1.37 mm (1.13–1.61) in ♂, 1.41 mm (1.29–1.54) in ♀; WL=2.55 mm in ♂, 2.30 mm (2.03–2.53) in ♀; WW=1.11 mm (0.91–1.31) in ♂, 1.13 mm (1.07–1.19) in ♀.

Indices: arb=6 (6–7)/5, FW/HW=0.47 (0.44–0.50), ch/o=0.20 (0.16–0.24), prorb=1.11 (0.94–1.24), rcorb=0.81 (0.74–0.85), vb=0.45 (0.35–0.58), dcl=0.48 (0.39–0.54), presctl=0.59 (0.48–0.64), sctl=1.74, sterno (anterior katepisternal/posterior katepisternal)=0.95 (0.88–1.06), orbito=1.88 (1.67–2.09), dcp=0.23 (0.17–0.25), sctlp=1.76 (1.50–2.00), C=2.11 (1.94–2.25), 4c=1.04 (0.96–1.10), 4v=1.79



Figs. 19–22. Phallic organs (19, 21, ventral view; 20, 22, lateral view). — 19, 20, *St. xuei*; 21, 22, *St. sidorenkoi*. (Scale-line=0.1 mm)

(1.69–1.93), $5x=1.46$ (1.28–1.75), $ac=10.34$ (8.50–13.00), $M=0.49$ (0.44–0.58), $C3F=0.66$ (0.59–0.76).

Specimens examined. Europe: 1 ♂, Aigle VD 5. 8. 70, coll. G. BÄCHLI; 1 ♂, Aaran 65/66, coll. V. SCHMIDT. Russia: 1 ♂, Komsomolsky Preserve, 50 km upper mouth of Gorin River, Far East, 30. VII. 1990; 1 ♂, Primorye, Iman River, vic. Dersu, 21. VIII. 1991, coll. V. SIDORENKO. Japan: 1 ♂, Sapporo, Hokkaido, 14. VIII. 1987; 1 ♀, ditto, 17. VIII. 1976; 1 ♀, Lake Toya, Hokkaido, 5. VIII. 1984; 1 ♀, ditto, 7. VIII. 1985, coll. M. J. TODA. China: 1 ♀, Shennongjia, Hubei, 2000 m alt., 27. VII. 1992, coll. M. J. TODA; 1 ♂, Lishan, Taiwan, 31. V. 1971, coll. K. KANMIYA.

Distribution. Europe, Russia (Far East, n. loc. rec.), Korea, Japan, China (Hubei, Taiwan; n. loc. rec.).

Remarks. Although LAŠTOVKA and MÁČA (1982, Fig. 96) figured and described gonopod (termed posterior paramere) winged and very wide, they certainly included a part of 10th sternite together. The gonopod proper is not widely winged but saddle-shaped as those of other members of this species-group.

Stegana (Steganina) xuei sp. nov.

(Figs. 3, 7, 9, 13, 19, 20, 23, 25, 26)

Diagnosis. Scutum with distinct longitudinal stripes; surstylus apically somewhat narrowing (Fig. 7); paramere present; aedeagus with serration of numerous,

minute processes on entire surface (Figs. 19, 20); gonopod dorsomedially with acute projection (Figs. 13, 20).

♂, ♀. Head: Ocellar triangle black. Frontal vitta brown in upper 1/2, dark brown in lower 1/4, light brown in medial 1/4 and in front of ocellar triangle. Fronto-orbital plate yellowish brown, anteriorly slightly paler. Face grayish brown in upper 1/2, white in medial 1/4, with black band on buccal margin; carina low, wide. Occiput dark brown. First flagellomere dark brown. Palpus distally somewhat flattened and broadened, with several setae apically to laterally and many setulae on underside.

Thorax: Scutum yellowish brown, with 3 pairs of dark brown longitudinal stripes: inner pair broad, posteriorly fused to each other, forming large, somewhat quadrate patch; middle pair narrow, running through entire length of scutum along dorsocentral lines, but posteriorly fused to inner pair; outer pair moderate in width, interrupted at transverse suture, fused to middle pair before transverse suture. Scutellum dark brown, apically paler. Acrostichal setulae in *ca.* 10 irregular rows. Basal scutellar setae divergent.

Wing: Dm-cu slightly clouded. Halter white.

Legs white; mid leg dark brown in distal 1/3 of femur and proximal 1/3 of tibia; fore and hind knee joints dark brown.

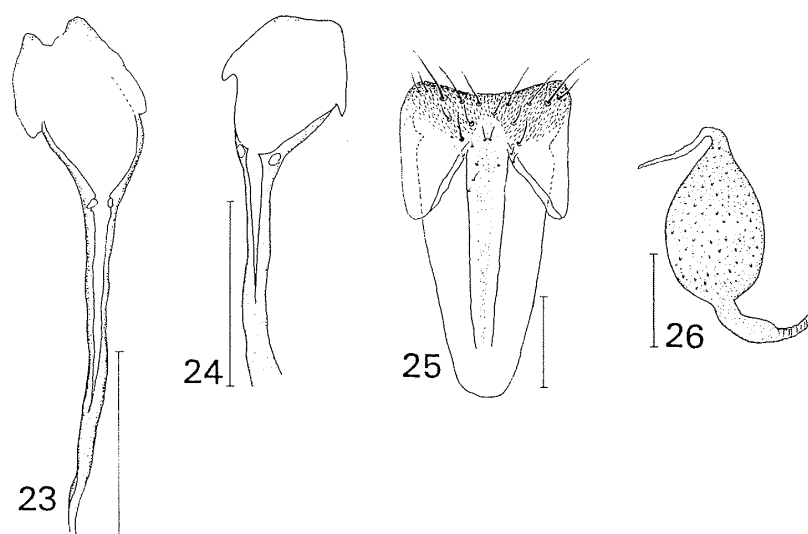
Abdomen: Sternites grayish yellow to brown, slightly broader than long.

♂ terminalia: Epandrium (Fig. 3) with *ca.* 40–50 setae; apodeme well developed, somewhat bilobed. Surstylus (Fig. 7) long, strongly curved inward, apically with 1 stout preniseta, with many setulae on inner surface and several ones on outer surface. Tenth sternite (Fig. 9) almost bilobed. Cercus (Fig. 3) narrow, somewhat triangular, ventrally broader and round, with *ca.* 50 setae. Median flaps of hypandrium semicircular; hypandrial apodeme shaping broad collar (Fig. 19). Gonopod (Fig. 13) saddle-shaped, apically nearly flat or slightly concave. Paramere (Fig. 19) small, somewhat triangular plate, with *ca.* 4 setulae. Aedeagus (Figs. 19, 20) broad, cylindrical; apico-ventral margin flat but apico-dorsal margin protruded convexly; apodeme *ca.* 1.7 times longer than aedeagus. Ejaculatory apodeme (Fig. 23) apically concave, with small expansions on lateral margins of distal plate.

♀ terminalia: Oviscapt (8th sternite, Fig. 25) anteriorly narrowed, pubescent and setigerous on caudal *ca.* 1/4. Spermatheca (Fig. 26) brown, pear-shaped, apically much narrowing and forming appendage-like process distally discolored; outer surface covered with numerous minute, hyaline warts; introvert absent.

Measurements: BL=2.84 mm in ♂; ThL=1.56 mm (1.46–1.80) in ♂, 1.73 mm (1.48–1.90) in ♀; WL=2.46 mm (2.30–2.77) in ♂, 2.81 mm (2.46–3.02) in ♀; WW=1.20 mm (1.13–1.32) in ♂, 1.34 mm (1.20–1.42) in ♀.

Indices: arb=7/5 (4–6), FW/HW=0.47 (0.44–0.50), ch/o=0.21 (0.18–0.23), prorb=1.14 (1.04–1.20), rcorb=0.80 (0.78–0.83), vb=0.47 (0.43–0.52), dcl=0.50 (0.45–0.54), presctl=0.65 (0.62–0.71), sctl=1.59 (1.43–1.80), orbito=1.90 (1.59–2.10), dcp=0.22 (0.18–0.27), sctlp=1.69 (1.56–1.78) in ♂, 1.99 (1.82–2.25) in ♀,



Figs. 23, 25, 26. *St. xuei*. 24, *St. sidorenkoi*. — 23–24, Ejaculatory apodeme; 25, oviscapt; 26, spermatheca. (Scale-line=0.1 mm)

$C=2.23$ (2.05–2.38), $4c=1.05$ (1.00–1.11), $4v=1.86$ (1.79–2.00), $5x=1.43$ (1.30–1.57), $ac=9.58$ (8.15–10.29), $M=0.52$ (0.48–0.59), $C3F=0.73$ (0.69–0.80).

Holotype ♂, China: Beijing, 1. VII. 1992, coll. M. J. TODA (DBSC).

Paratypes: China: 2 ♂, 3 ♀, same data as holotype (EHU); 1 ♂, Shenyang, Liaoning, VIII. 1991, coll. Y.-g. HU (DBSC). Russia: 1 ♂, Far East, 4. VI. 1991, coll. V. SIDORENKO (IBP).

Distribution. Russia (Far East), China (Liaoning, Beijing).

Relationship. This species is closely related to the foregoing species, *St. nigrithorax*, but distinguishable from the latter by the diagnostic characters, *i.e.*, in *St. nigrithorax*: scutum nearly entirely yellowish brown to brown, or with obscure longitudinal stripes; surstylus apically somewhat truncate (Fig. 6); paramere absent (Fig. 17); number of minute processes on aedeagus moderate (Figs. 17, 18); acute projection present dorso-apically on gonopod (Figs. 12, 18).

Etymology. Patronym, in honor of Prof. Wanqi XUE, Shenyang Teachers' College, who promoted the joint survey on drosophilid fauna of Liaoning Province, China and encouraged the senior author in the course of this study.

***Stegana (Steganina) sidorenkoi* sp. nov.**

(Figs. 4, 8, 10, 14, 21, 22, 24)

Diagnosis. Surstylus very broad, apically round (Fig. 8); epandrial apodeme almost undeveloped (Fig. 4); 10th sternite not largely bilobed, caudally triangularly protruded (Fig. 10); hypandrial apodeme less developed (Fig. 21); gonopod serrated on dorsomedian ridge.

♂. Head: Ocellar triangle yellowish brown, posteriorly darker, black on

inner margins of ocelli. Frontal vitta grayish brown in upper 1/2, dark grayish brown in lower 1/4, grayish yellow in medial 1/4 and in front of ocellar triangle. Fronto-orbital plate brownish yellow, anteriorly slightly paler. Face dark gray in upper 1/2, white in medial 1/4, with grayish black band on buccal margin; carina low, narrow. Occiput grayish brown. First flagellomere grayish brown, marginally darker. Palpus club-shaped, with *ca.* 5–6 moderate setae apically and laterally.

Thorax: Scutum brownish yellow, with 3 pairs of diffuse, dark brown, longitudinal stripes: inner pair running inside of dorsocentral lines from anterior margin to middle part; middle pair running along dorsocentral lines from transverse suture to posterior margin, anteriorly somewhat fused to inner pair; outer pair interrupted at transverse suture, darker and broader before transverse suture. Scutellum dark brown, medially and apically paler. Acrostichal setulae in *ca.* 10 irregular rows. Basal scutellar setae divergent.

Wing: Dm-cu slightly clouded.

Legs nearly entirely yellowish white.

♂ terminalia: Epandrium (Fig. 4) with *ca.* 46 setae. Surstylus (Fig. 8) densely setigerous on ventral margin, sparsely pubescent on outer surface, subapically with 1 prominent, apically round preniseta and *ca.* 6 long setae. Cercus (Fig. 4) small, oval, with *ca.* 30 setae. Median flaps of hypandrium somewhat low, semicircular (Fig. 21). Aedeagal guide (Fig. 21) caudally bilobed. Gonopod (Fig. 14) saddle-shaped. Paramere small, triangular plate, with *ca.* 3–4 setulae. Aedeagus (Figs. 21, 22) broad, somewhat flat, with serration of several large teeth; apico-ventral margin flat but apico-dorsal margin medially strongly protruded; apodeme as long as aedeagus. Ejaculatory apodeme (Fig. 24) apically nearly flat, with small expansions on lateral margins of distal plate.

Measurements: ThL=1.48 mm, WL=2.17 mm, WW=1.04 mm.

Indices: arb=5/5, FW/HW=0.46, ch/o=0.20, pror=1.08, rcorb=0.91, vb=0.52, dcl=0.52, presct=0.60, sterno=1.01, orbito=1.61, dcp=0.23, scltp=1.56, C=2.13, 4c=1.00, 4v=1.69, 5x=1.22, ac=16.00, M=0.38, C3F=0.75.

Holotype ♂, Russia: Primorye, Ussurian Preserve, 26. V. 1990, coll. V. SIDORENKO (IBP).

Distribution. Russia (Far East).

Relationship. This species is very special in the diagnostic characters among the members of the *coleoprata* species-group. The consistency in the basic structure of phallic organs (aedeagus, hypandrium, etc.), however, ascertains that this species belongs to the *coleoprata* group. On the other hand, its very broad, apically round surstylus suggests some relationships to other species having globular surstylus, e.g., *St. (Steganina) unidentata* TAKADA, 1968 and *St. (Steganina) shirozui* OKADA, 1971. Based upon the result of phenetic analysis, OKADA (1971) included the last two species into "group 1", together with some members of the *coleoprata* group. LAŠTOVKA and MÁČA (1982), however, excluded those two species from the *coleoprata* group, suggesting that they form another species-group. The present new

species may be a link species connecting these two groups.

Etymology. Patronym, in honor of Dr. Vasilij SIDORENKO, the Institute of Biology and Pedology, Far-Eastern Division of the Russian Academy of Sciences, who provided us with the specimen.

Acknowledgements

We wish to thank Prof. W.-q. XUE, Messrs. Y.-s. CHUI and H.-w. CHEN of Shenyang Teachers' College and Dr. H. WATABE of Hokkaido University of Education, who understood and encouraged us in the course of this joint study. Our sincere thanks are also due to the following colleagues who have kindly provided us with valuable materials: Dr. G. BÄCHLI of University of Zürich-Irchel, Emeritus Prof. T. OKADA of Tokyo Metropolitan University, and Dr. V. SIDORENKO of Institute of Biology and Pedology, Vladivostok. This work was partly supported by a Grant-in-Aid for Overseas Scientific Survey from the Ministry of Education, Science and Culture, Japan (Nos. 01041078, 03041068).

References

- LAŠTOVKA, P., & J. MÁČA, 1982. European and North American species of the genus *Stegana* (Diptera, Drosophilidae). *Annot. zool. bot.*, **149**: 1–38.
- OKADA, T., 1971. A revision and taxometric analysis of the genus *Stegana* MEIGEN of Japan and adjacent countries. *Mushi*, **45**: 81–99.
- ZHANG, W. X., & M. J. TODA, 1992. A new species-subgroup of the *Drosophila immigrans* species-group (Diptera, Drosophilidae), with description of two new species from China and revision of taxonomic terminology. *Jpn. J. Ent.*, **60**: 839–850.

(Received September 16, 1993; Accepted October 28, 1993)